

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

76446

IND/STA

served

United States
Department of
Agriculture

Forest Service

Intermountain
Forest and Range
Experiment Station
Ogden, UT 84401

Resource
Bulletin
INT-31

June 1983



Forest Area and Timber Resource Statistics for State and Private Lands in McKinley, San Juan, and Valencia Counties, New Mexico, 1979

Velma J. Sterrett
Dorothy G. Felt

PROCUREMENT SECTION
CURRENT SERIAL RECORDS

AUG 9 '83

U.S.D.A.
NATL. AGRIC. LIBRARY
RECEIVED

THE AUTHORS

VELMA J. STERRETT is a Statistical Assistant with the Forest Survey Research Work Unit at the Intermountain Forest and Range Experiment Station in Ogden, Utah.

DOROTHY G. FELT is now retired. She was a Supervisory Statistical Assistant with the Forest Survey Research Work Unit at the Intermountain Forest and Range Experiment Station in Ogden, Utah.

ACKNOWLEDGMENTS

The Intermountain Station gratefully acknowledges the cooperation of the New Mexico Division of State Forestry and State and Private Forestry, Forest Service, Southwestern Region. Appreciation is also expressed for the cooperation of other public agencies and private landowners in providing information and access to the sample locations.

RESEARCH SUMMARY

Presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Forest Survey standards.

CONTENTS

	Page
Introduction	1
Highlights	1
Area	1
Inventory	1
Growth and Mortality	2
How the Inventory Was Conducted	2
Data Reliability	2
Terminology and Data Tables	3
Land	3
Water	3
Land Use Classes	3
Public Ownership Classes	4
Private and Other	4
Forest Type and Tree Species	4
Area Condition Classes	4
Class of Timber	4
Tree-Size Classes	5
Volume	5
Growth and Mortality	5
Site	5
Stand-Size Classes	5

FOREST SURVEY TABLES

	Page
1. Area of forest land in McKinley, San Juan, and Valencia Counties with percent standard error, 1979	3
2. Net volume, net annual growth, and annual mortality of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties with percent standard error, 1979	3
3. Total land and water area in McKinley, San Juan, and Valencia Counties by ownership class, 1979	6
4. Total land area in McKinley, San Juan, and Valencia Counties by major land class and ownership class, 1979	6
5. Area of commercial timberland in McKinley, San Juan, and Valencia Counties by forest type, stand-size class, and productivity class, 1979 ...	7
6. Area of State-owned commercial timberland in McKinley, San Juan, and Valencia Counties by forest type, stand-size class, and productivity class, 1979	8
7. Area of privately owned commercial timberland in McKinley, San Juan, and Valencia Counties by forest type, stand-size class, and productivity class, 1979	9
8. Area of commercial timberland in McKinley, San Juan, and Valencia Counties by stand volume and ownership class, 1979	10
9. Area of commercial timberland in McKinley, San Juan, and Valencia Counties by forest type and area condition class, 1979	10
10. Area of productive reserved and other forest land in McKinley, San Juan, and Valencia Counties by land class, ownership class, and forest type, 1979	11
11. Number of growing stock trees on commercial timberland in McKinley, San Juan, and Valencia Counties by species and diameter class, 1979 ..	12
12. Number of cull and salvable dead trees on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, and softwoods and hardwoods, 1979	13
13. Net volume of growing stock on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, forest type, and stand-size class, 1979	14
14. Net volume of sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, forest type, and stand-size class, 1979	15
15. Net volume of growing stock on commercial timberland in McKinley, San Juan, and Valencia Counties by species and diameter class, 1979 ..	16
16. Net volume of sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by species and diameter class, 1979 ..	16
17. Net volume of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class and species, 1979	17

FOREST SURVEY TABLES (con.)

	Page
18. Net volume of timber on commercial timberland in McKinley, San Juan, and Valencia Counties by class of timber, and softwoods and hardwoods, 1979	18
19. Net volume of growing stock on commercial timberland in McKinley, San Juan, and Valencia Counties by forest type and species, 1979	18
20. Net volume of sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by forest type and species, 1979	19
21. Net annual growth of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class and species, 1979	20
22. Annual mortality of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, and softwoods and hardwoods, 1979	21
23. Annual mortality of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by cause of death and species, 1979	22

FIGURE

1. McKinley, San Juan, and Valencia Counties, New Mexico	2
--	---

245

Forest Area and Timber Resource Statistics for State and Private Lands in McKinley, San Juan, and Valencia Counties, New Mexico, 1979 [J.]

100
Velma J. Sterrett
Dorothy G. Felt

INTRODUCTION

This resource bulletin presents the principal findings of the second forest inventory of State and private lands in McKinley, San Juan, and Valencia Counties, New Mexico (fig. 1). Valencia County, as shown in this report, is now divided into Valencia and Cibola Counties. Fieldwork conducted by personnel from the New Mexico Division of State Forestry began in September 1979 and was completed in November 1979. The 1962 statewide inventory did not sample these counties intensively and did not report findings at the working circle level.

The primary objective of Forest Survey, a continuing nationwide undertaking conducted by the Forest Service, U.S. Department of Agriculture, is to provide an assessment of the renewable resource situation for forest and rangelands of the Nation. Fundamental to the accomplishment of this objective are the periodic State-by-State resource inventories. Originally, Forest Survey was authorized by the McSweeney-McNary Act of 1928. The current authorization is through the Renewable Resources Research Act of 1978.

The resource inventories for the Rocky Mountain States of Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, Wyoming, and western South Dakota are administered by the Intermountain Forest and Range Experiment Station with headquarters in Ogden, Utah. These inventories provide information on the extent and condition of State and privately owned forest lands, volume of timber, and rates of timber growth and mortality. These data, when combined with similar information on Federal lands, provide a basis for the formulation of forest policies and programs and for the orderly development and use of the resources.

The three-county area covered by this report is one of 11 working circles in New Mexico. Similar reports have been issued for Colfax, Santa Fe, San Miguel, Taos-Rio Arriba and Bernalillo, Sandoval and Torrance Working Circles. A report covering all counties in New Mexico will be issued when the Statewide inventory data have been compiled and summarized. The total land area in McKinley, San Juan, and Valencia Counties is 10,611,007 acres (4 294 140 hectares). Lands managed by the Forest Service; and the U.S. Department of Interior's Bureau of Land Management, National Park Service, and Indian trust lands together account for 7,288,880 acres (2 949 717 hectares), or 69 percent of this land. The remaining 3,322,127 acres (1 344 423 hectares) are in State, private, and other ownerships. DATA PRESENTED HERE ARE FOR

STATE, PRIVATE, MISCELLANEOUS FEDERAL,
AND A SMALL ACREAGE OF COUNTY AND
MUNICIPAL LANDS ONLY.

Highlights show the area of commercial timberland in comparison to total forest land area and the distribution of this area by forest type, stand-size class, and site class. Discussions of the data reliability and terminology are included. These two items should be reviewed carefully when using this information.

HIGHLIGHTS

Area

- The forest land area is 768 thousand acres (311 thousand hectares), or 23 percent of the total State and private land area in McKinley, San Juan, and Valencia Counties.
- Of the forest land, 65.9 thousand acres (26.6 thousand hectares), almost 9 percent, is classified as commercial timberland.
- Private ownership accounts for 60.6 thousand acres (24.5 thousand hectares), or 92 percent of the commercial timberland.
- Ponderosa pine is the predominant type and occupies 91 percent of the commercial timberland. Douglas-fir, cottonwood, and aspen cover the remaining area.
- Over half of the commercial timberland is in the 20 to 49 cubic foot productivity class; 92 percent of this is privately owned.

Inventory

- Growing stock volume amounts to 43.4 million cubic feet (1.2 million cubic meters) and sawtimber volume totals 177.9 million board feet.
- Rough, rotten, and salvable dead trees comprise 6.5 million cubic feet (185 thousand cubic meters), 13 percent of the total sound wood volume.
- The largest share of the total growing stock volume is made up of ponderosa pine (92 percent). Aspen, Douglas-fir, cottonwood, Engelmann spruce, and pinyon/juniper account for the remaining volume. Although pinyon/juniper usually occurs on unproductive forest land, when it occurs in mixtures with commercial species on productive sites, it is reported in the commercial timberland statistics.
- Private owners control 92 percent of both the total growing stock and the sawtimber volume.

NEW MEXICO

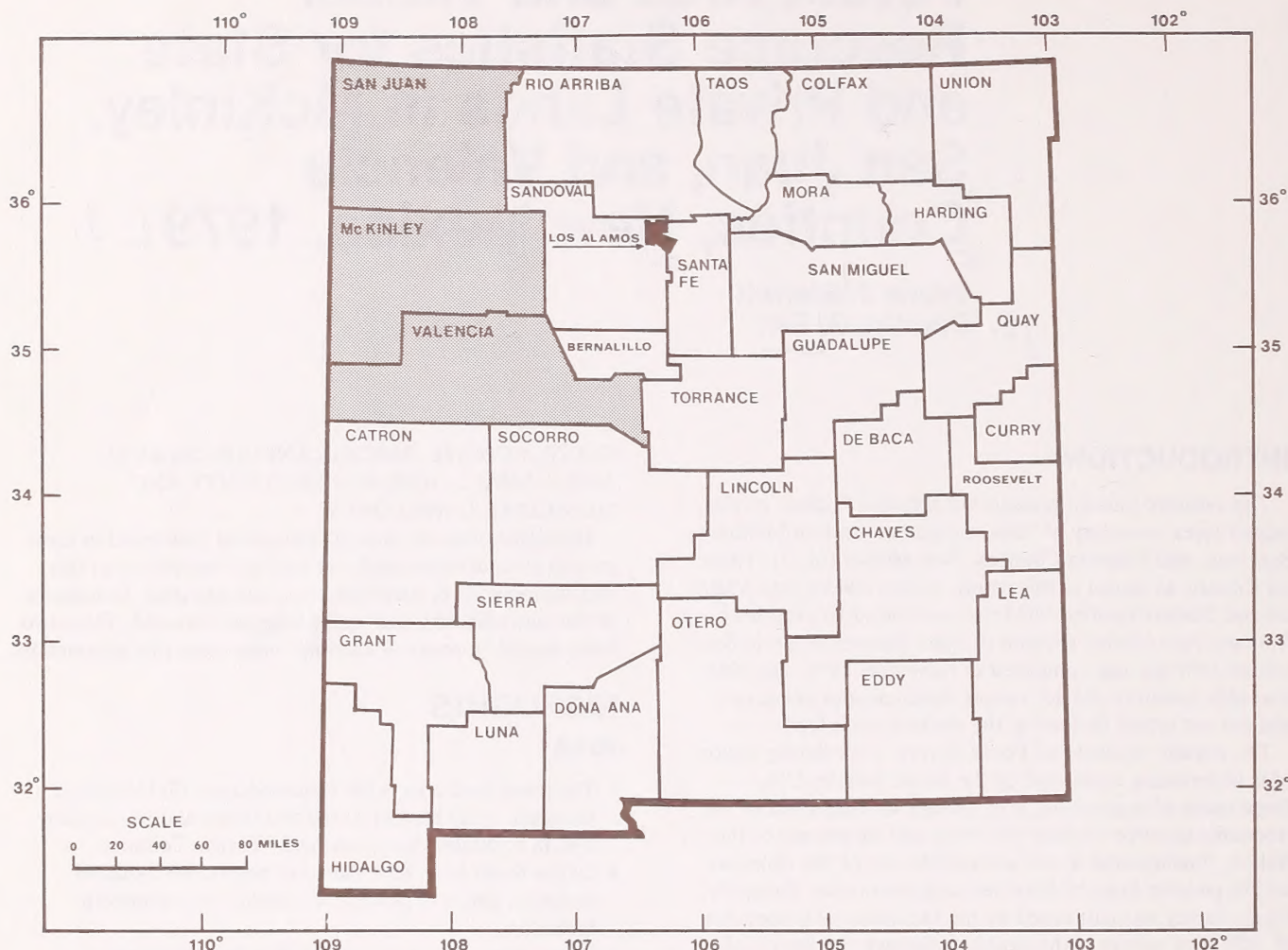


Figure 1.--McKinley, San Juan, and Valencia Counties, New Mexico.

Growth and Mortality

- Net annual growth of growing stock totals 1,169 thousand cubic feet (33 thousand cubic meters). Growth and mortality were not measured for pinyon and juniper trees.
- About 93 percent of the total net growth is on private lands.
- The annual mortality of 43 thousand cubic feet (1 thousand cubic meters) offsets 4 percent of the gross annual growth.

HOW THE INVENTORY WAS CONDUCTED

The inventory was designed to provide reliable statistics primarily at the State and working circle levels. Procedures were:

1. Initial area estimates were based on the classification of 11,340 sample points systematically placed on the latest aerial photographs available. The sample points were summarized and grouped into strata for subsequent field sampling. The photo-points, adjusted to meet known land areas, were used to compute area expansion factors for the field stratum means.

2. Land classification and estimates of timber characteristics and volume were based on observations and measurement recorded at 295 ground sample locations of which 177 were forested. Sample trees were selected using a 10-point cluster which includes fixed plots (1/300 acre) for trees less than 5.0 inches diameter at breast height (d.b.h.) and variable plots (40 BAF [basal area factor]) for trees 5.0 inches d.b.h. or larger.

3. Equations prepared from detailed measurements collected on standing trees throughout the Southwest were used to compute the volume and defect of individual tally trees.

4. All photo and field data were sent to Ogden, Utah, for editing and were punched onto cards and stored for machine computing, sorting, and tabulation. Final estimates were based on statistical summaries of the data.

DATA RELIABILITY

Individual cells within tables should be used with caution. Some are based on very small sample sizes, and so result in high sampling errors. The standard error percents shown in tables 1 and 2 were calculated at the 67 percent confidence level.

Table 1.--Area of forest land in McKinley, San Juan, and Valencia Counties with percent standard error, 1979

Item	Softwoods		Hardwoods		All types	
	Acres	Percent standard error	Acres	Percent standard error	Acres	Percent standard error
Commercial timberland	62,463	±11.5	3,389	±60.8	65,852	±10.8
Productive reserved ¹	189		434		623	
Other forest land:						
Unproductive reserved ¹	11,000		4,768		15,768	
Unproductive nonreserved	667,940	±1.4	18,095	±14.6	686,035	±1.4

¹Reserved land areas are estimated from aerial photos without field verification; therefore, standard errors are not calculated.

Table 2.--Net volume, net annual growth, and annual mortality of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties with percent standard error, 1979

Item	Softwoods		Hardwoods		All types	
	Volume	Percent standard error	Volume	Percent standard error	Volume	Percent standard error
Net volume:						
Growing stock (M cubic feet)	41,325	±14.0	2,057	±54.4	43,382	±13.7
Sawtimber (M board feet ¹)	171,465	±14.2	6,456	±80.5	177,921	±14.1
Net annual growth:						
Growing stock (cubic feet)	1,083,126	±14.1	85,980	±56.7	1,169,106	±14.0
Sawtimber (board feet ¹)	4,809,749	±16.2	271,460	±76.7	5,081,209	±15.9
Annual mortality:						
Growing stock (cubic feet)	43,044	±53.4	--	--	43,044	±53.4
Sawtimber (board feet ¹)	168,263	±69.2	--	--	168,263	±69.2

¹International 1/4-inch rule.

TERMINOLOGY AND DATA TABLES

This section contains definitions relevant to the timber resource data presented in this resource bulletin. Forest area and timber resource data for McKinley, San Juan, and Valencia Counties in New Mexico are displayed in tables 3 through 23.

Land

Land.—As defined by the Bureau of the Census, the area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds less than 40 acres in area. Includes noncensus water. See definition below.

Water

Census water.—As defined by the Bureau of the Census, streams, sloughs, estuaries, and canals more than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds more than 40 acres in area.

Noncensus water.—The same as defined by the Bureau of the Census, except minimum width of streams, sloughs, estuaries, and canals is 120 feet and minimum size of lakes, reservoirs, and ponds is 1 acre.

Land Use Classes

Forest land.—Land at least 16.7 percent stocked by forest trees of any size, or formerly having had such tree cover, and not currently developed for nonforest use.

Commercial timberland.—Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization. (Areas qualifying have the capability of producing in excess of 20 cubic feet per acre per year of industrial wood under management. Currently inaccessible and inoperable areas are included, except when the areas involved are small and unlikely to become suitable for production of industrial wood in the foreseeable future.)

Productive-reserved forest land.—Forest land sufficiently productive to qualify as commercial timberland, but withdrawn

from timber utilization through statute, administrative designation, or exclusive use for Christmas tree production.

Other forest land.—Forest land incapable of producing 20 cubic feet per acre of industrial wood under management, because of adverse site conditions; includes both reserved and nonreserved forest land.

Nonforest land.—Land that has never supported forests and lands formerly forested where use for timber management is precluded by development for other uses.

Public Ownership Classes

National Forest lands.—Federal lands legally designated as National Forest or purchase units and other lands under the administration of the Forest Service, including experimental areas and Bankhead-Jones Title III lands.

Bureau of Land Management lands.—Federal lands administered by the Bureau of Land Management.

Indian lands.—Tribal lands held in fee by the Federal Government, but administered for Indian tribal groups and Indian trust allotments.

State lands.—Lands owned by States, or lands leased to these governmental units for 50 years or more.

Private and Other

County and municipal lands.—Lands owned by counties and local public agencies or municipalities, or lands leased to these governmental units for 50 years or more.

Forest industry lands.—Lands owned by companies or by individuals operating wood-processing plants.

Farmer-owned lands.—Lands owned by farm operators. (These exclude lands leased by farm operators from such non-farm owners as railroad companies and States.)

Miscellaneous Federal lands.—Federal lands other than the following: (1) National Forest lands; (2) lands administered by the Bureau of Land Management; and (3) Indian lands.

Miscellaneous private lands.—Privately owned lands other than forest industry and farmer-owned lands.

Forest Type and Tree Species

Forest types.—A classification of forest land based upon the species forming a plurality of live-tree stocking.

Forest trees.—Woody plants having a well-developed stem and usually more than 12 feet in height at maturity.

Commercial species.—Tree species presently or prospectively suitable for industrial wood products.

Softwoods.—Coniferous trees, usually evergreen, having needles or scalelike leaves.

Hardwoods.—Dicotyledonous trees, usually broad-leaved and deciduous.

Area Condition Classes

Stocking.—Stocking is an expression of the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. “Percent of stocking” is synonymous with “percentage of growing space occupied” and means the ratio of actual stocking to full stocking for comparable sites and stands. Basal area is used as a basis for measuring stocking.

“Stocking percentages” express current area occupancy in relation to specified standards for full stocking based on number, size, and spacing of trees considered necessary to fully utilize the forest land.

Full utilization of the site is assumed to occur over a range of basal area. As an interim guide, 60 percent of the normal yield table values has been used to establish the lower limit of this range which represents full-site occupancy. This is called 100-percent stocking. The upper limit of full stocking has been set at 132 percent. Sites with less than 100-percent stocking represent understocking with less than full-site occupancy. Overstocking is characterized by sites with 133 percent or more stocking.

Class 10.—Areas fully stocked (100 to 132 percent) with desirable trees and not overstocked (133 percent or more).

Class 20.—Areas fully stocked with desirable trees, but overstocked with all live trees.

Class 30.—Areas medium to fully stocked (60 to 99 percent) with desirable trees and with less than 30 percent of the area controlled by other trees and/or inhibiting vegetation or surface conditions that will prevent occupancy by desirable trees.

Class 40.—Areas medium to fully stocked with desirable trees and with 30 percent or more of the area controlled by other trees and/or conditions that ordinarily prevent occupancy by desirable trees.

Class 50.—Areas poorly stocked (16.7 to 59 percent) with desirable trees, but fully stocked with growing stock trees.

Class 60.—Areas poorly stocked with desirable trees, but with medium to full stocking of growing stock trees.

Class 70.—Areas nonstocked (less than 16.7 percent) to poorly stocked with desirable trees, and poorly stocked with growing stock trees.

Class 80.—Low-risk old-growth stands.

Class 90.—High-risk old-growth stands.

Nonstocked.—Areas less than 16.7 percent stocked with growing stock trees.

Class of Timber

Growing stock trees.—Live trees of commercial species qualifying as desirable or acceptable trees. (Excludes rough, rotten, and dead trees.)

Desirable trees.—Growing stock trees (1) having no serious defect in quality limiting present or prospective use for timber products; (2) of relatively high vigor; and (3) containing no pathogens that may result in death or serious deterioration before rotation age.

Acceptable trees.—Growing stock trees meeting specified standards of size and quality, but not qualifying as desirable trees.

Rough trees.—(1) Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of roughness or poor form; and (2) all live trees of noncommercial species.

Rotten trees.—Live trees that do not contain at least one 12-foot saw log or two noncontiguous saw logs, each 8 feet or longer, now or prospectively, and/or do not meet Rocky Mountain regional specifications for freedom from defect primarily because of rot; that is, when more than 50 percent of the cull volume (cubic-foot basis) in a tree is rotten.

Salvable dead trees.—Standing or down dead trees that are considered merchantable by Rocky Mountain regional standards.

Saw-log portion.—That part of the bole of sawtimber trees between the stump and the saw-log top. A 1-foot stump is used.

Upper-stem portion.—That part of the bole of sawtimber trees above the saw-log top to a minimum top diameter of 4.0 inches outside bark or to the point where the central stem breaks into limbs, whichever occurs first.

Tree-Size Classes

Seedlings.—Live trees less than 1.0 inch d.b.h.

Saplings.—Trees 1.0 to 4.9 inches d.b.h.

Poletimber trees.—Trees at least 5.0 inches d.b.h., but smaller than sawtimber size.

Sawtimber trees.—Trees exceeding poletimber size. In the Intermountain States, the minimum d.b.h. for softwood sawtimber is 9.0 inches and for hardwoods 11.0 inches.

Volume

Cull volume.—Portions of a tree's volume that are not usable for industrial wood products because of rot, form, or other defect.

Net volume.—Gross volume less deductions for cull.

Growing stock volume.—Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) outside bark. Net volume equals gross volume less deduction for rot and missing bole sections.

Sawtimber volume.—Net volume in board feet of sawtimber trees of commercial species. Net volume equals gross volume less deduction for rot, sweep, crook, and other defects that affect use for lumber.

Growth and Mortality

Net annual growth.—The increase in net growing stock volume of a specified size class for a specific year. (Components of net annual growth include the increment in net volume of trees at the beginning of the specific year and surviving to its end, plus the net volume of trees reaching the size class during the year, minus the net volume of trees that died during the year, minus the net volume of trees that became rough or rotten trees during the year.)

Mortality.—Number or sound-wood volume of growing stock trees dying from natural causes during a specified period, usually annually.

Site

Site class.—A classification of forest land in terms of inherent capacity to grow crops of industrial wood.

Site classifications are based upon the mean net annual growth of growing stock (not including thinnings or mortality loss) attainable at culmination of mean net annual growth over age. Height-age relationships are usually used as indicators of the specified volume-site class.

Stand-Size Classes

Sawtimber stands.—Stands at least 16.7 percent stocked with growing stock trees, with half or more of total stocking in sawtimber or poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Poletimber stands.—Stands at least 16.7 percent stocked with growing stock trees in which half or more of this stocking is in poletimber and/or sawtimber trees, and with poletimber stocking exceeding that of sawtimber.

Sapling-seedling stands.—Stands at least 16.7 percent stocked with growing stock trees in which more than half of the stocking is saplings and/or seedlings.

Nonstocked land.—Commercial timberland less than 16.7 percent stocked with growing stock trees.

FOREST SURVEY TABLES

Table 3.--Total land and water area in McKinley, San Juan, and Valencia Counties by ownership class, 1979

Ownership class	Area	
	- - Acres - -	- - Hectares - -
Land:		
National Forest	509,584	206 222
Bureau of Land Management	1,503,443	608 425
National Park	22,816	9 233
Indian trust lands	5,253,037	2 125 837
State	546,412	221 126
Private ¹	2,775,715	1 123 297
Total	10,611,007	4 294 140
Census water	15,616	6 320
Total land and water ²	10,626,623	4 300 460

¹In this and all following tables, the private ownership category includes farmer-owned and other private ownerships, a small acreage of county and municipal ownerships, and miscellaneous Federal ownership.

²U.S. Bureau of the Census, land and water area of the United States, 1980.

Table 4.--Total land area in McKinley, San Juan, and Valencia Counties by major land class and ownership class, 1979

Land class	Ownership class				Total	
	State		Private		Acres	Hectares
	Acres	Hectares	Acres	Hectares		
Commercial timberland	5,216	2 111	60,636	24 538	65,852	26 649
Productive reserved	434	171	189	276	623	252
Other forest land:						
Unproductive reserved	9,827	3 977	5,941	2 404	15,768	6 381
Unproductive nonreserved	141,870	57 413	544,165	220 217	686,035	277 630
Total forest land	157,347	63 677	610,931	247 235	768,278	310 912
Nonforest land	389,065	157 449	2,184,177	883 910	2,573,242	1 041 359
Total land area	546,412	221 126	2,795,108	1 131 145	3,341,520	1 352 271

Table 5.--Area of commercial timberland in McKinley, San Juan, and Valencia Counties by forest type, stand-size class, and productivity class, 1979

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	- - - - - Acres - - - - -				
Douglas-fir:					
Sawtimber	--	--	--	1,029	1,029
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	1,372	1,372
Nonstocked	--	--	--	--	--
Total	--	--	--	2,401	2,401
Ponderosa pine:					
Sawtimber	--	--	21,168	26,542	47,710
Poletimber	--	--	4,346	2,601	6,947
Sapling and seedling	--	--	1,029	2,802	3,831
Nonstocked	--	--	--	1,574	1,574
Total	--	--	26,543	33,519	60,062
Aspen:					
Sawtimber	--	--	1,029	--	1,029
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	1,029	--	1,029
Cottonwood:					
Sawtimber	--	1,631	--	--	1,631
Poletimber	--	--	--	729	729
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	1,631	--	729	2,360
All types:					
Sawtimber	--	1,631	22,197	27,571	51,399
Poletimber	--	--	4,346	3,330	7,676
Sapling and seedling	--	--	1,029	4,174	5,203
Nonstocked	--	--	--	1,574	1,574
Total	--	1,631	27,572	36,649	65,852

Table 6.--Area of State-owned commercial timberland in McKinley, San Juan, and Valencia Counties by forest type, stand-size class, and productivity class, 1979

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	- - - - - Acres - - - - -				
Douglas-fir:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	224	224
Nonstocked	--	--	--	--	--
Total	--	--	--	224	224
Ponderosa pine:					
Sawtimber	--	--	1,733	2,198	3,931
Poletimber	--	--	440	174	614
Sapling and seedling	--	--	--	165	165
Nonstocked	--	--	--	135	135
Total	--	--	2,173	2,672	4,845
Aspen:					
Sawtimber	--	--	--	--	--
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	--	--	--
Cottonwood:					
Sawtimber	--	110	--	--	110
Poletimber	--	--	--	37	37
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	110	--	37	147
All types:					
Sawtimber	--	110	1,733	2,198	4,041
Poletimber	--	--	440	211	651
Sapling and seedling	--	--	--	389	389
Nonstocked	--	--	--	135	135
Total	--	110	2,173	2,933	5,216

Table 7.--Area of privately owned commercial timberland in McKinley, San Juan and Valencia Counties by forest type, stand-size class, and productivity class, 1979

Forest type and stand-size class	Productivity class				Total acres
	120+	85-119	50-84	20-49	
	- - - - - Acres - - - - -				
Douglas-fir:					
Sawtimber	--	--	--	1,029	1,029
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	1,148	1,148
Nonstocked	--	--	--	--	--
Total	--	--	--	2,177	2,177
Ponderosa pine:					
Sawtimber	--	--	19,435	24,344	43,779
Poletimber	--	--	3,906	2,427	6,333
Sapling and seedling	--	--	1,029	2,637	3,666
Nonstocked	--	--	--	1,439	1,439
Total	--	--	24,370	30,847	55,217
Aspen:					
Sawtimber	--	--	1,029	--	1,029
Poletimber	--	--	--	--	--
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	--	1,029	--	1,029
Cottonwood:					
Sawtimber	--	1,521	--	--	1,521
Poletimber	--	--	--	692	692
Sapling and seedling	--	--	--	--	--
Nonstocked	--	--	--	--	--
Total	--	1,521	--	692	2,213
All types:					
Sawtimber	--	1,521	20,464	25,373	47,358
Poletimber	--	--	3,906	3,119	7,025
Sapling and seedling	--	--	1,029	3,785	4,814
Nonstocked	--	--	--	1,439	1,439
Total	--	1,521	25,399	33,716	60,636

Table 8.--Area of commercial timberland in McKinley, San Juan, and Valencia Counties by stand volume and ownership class, 1979

Stand volume per acre ¹	Ownership class		
	State	Private	State and private
	- - - - -	- - - - - Acres	- - - - -
Less than 1,500 board feet	1,422	18,263	19,685
1,500 to 4,999 board feet	3,068	31,313	34,381
5,000 to 9,999 board feet	726	11,060	11,786
10,000 board feet or more	--	--	--
All classes	5,216	60,636	65,852

¹International 1/4-inch rule.

Table 9.--Area of commercial timberland in McKinley, San Juan, and Valencia Counties by forest type and area condition class, 1979

Forest type	Area condition class										Nonstocked	All classes
	10	20	30	40	50	60	70	80	90			
	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - - Acres	- - - - -	- - - - -	- - - - -	- - - - -	- - - - - Hectares
Douglas-fir	--	--	--	--	--	--	2,401	--	--	--	--	2,401 972
Ponderosa pine	--	--	--	--	2,945	18,022	28,942	--	8,579	1,574	60,062	24 306
Aspen	--	--	--	--	--	1,029	--	--	--	--	1,029	416
Cottonwood	--	--	--	--	--	--	2,360	--	--	--	2,360	955
All types	--	--	--	--	2,945	19,051	33,703	--	8,579	1,574	65,852	26 649

Table 10.--Area of productive reserved and other forest land in McKinley, San Juan, and Valencia Counties by land class, ownership class, and forest type, 1979

Land class	Forest type								All types
	Ponderosa pine	Pinyon- juniper	Mixed softwoods	Total softwoods	Oak	Cottonwood	Other hardwoods	Total hardwoods	
Productive reserved area:									
State	--	--	--	--	--	--	434	434	434
Private	189	--	--	189	--	--	--	--	189
Total	189	--	--	189	--	--	434	434	623
Other forest land area:									
Unproductive reserved:									
State	--	5,059	--	5,059	1,734	--	3,034	4,768	9,827
Private	--	5,941	--	5,941	--	--	--	--	5,941
Total	--	11,000	--	11,000	1,734	--	3,034	4,768	15,768
Unproductive nonreserved:									
State	--	141,540	38	141,578	--	37	255	292	141,870
Private	--	525,670	692	526,362	--	692	17,111	17,803	544,165
Total	--	667,210	730	667,940	--	729	17,366	18,095	686,035
Total all areas:									
State	--	146,599	38	146,637	1,734	37	3,723	5,494	152,131
Private	189	531,611	692	532,492	--	692	17,111	17,803	550,295
Total acres	189	678,210	730	679,129	1,734	729	20,834	23,297	702,426
Total hectares									
Total hectares	76	274,463	296	274,835	702	295	8,431	9,428	--
Total acres									
Total acres	--	--	--	--	--	--	--	--	--

Table 11.--Number of growing stock trees on commercial timberland in McKinley, San Juan, and Valencia Counties by species and diameter class, 1979

Species	Diameter class (inches at breast height)																All classes
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	Thousand trees																
Douglas-fir	409	93	35	46	37	7	7	--	2	--	5	1	1	--	--	643	
Ponderosa pine	1,005	1,514	1,085	1,223	847	548	298	204	145	70	46	13	11	6	11	7,026	
Engelmann spruce	93	93	22	11	15	--	--	--	--	--	--	--	--	--	--	234	
Pinyon/juniper	98	91	--	--	--	5	--	--	4	--	--	--	--	--	--	198	
Total softwoods	1,605	1,791	1,142	1,280	899	560	305	204	151	70	51	14	12	6	11	8,101	
Aspen	31	62	63	43	--	10	8	6	8	2	2	--	--	--	--	235	
Cottonwood	--	71	55	29	17	4	--	--	--	--	2	2	--	--	--	180	
Total hardwoods	31	133	118	72	17	14	8	6	8	2	4	2	--	--	--	415	
All species	1,636	1,924	1,260	1,352	916	574	313	210	159	72	55	16	12	6	11	8,516	

Table 12.--Number of cull and salvable dead trees on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, and softwoods and hardwoods, 1979

Ownership class and species group	Cull trees		Total	Salvable dead trees
	Sound	Rotten		
----- Thousand trees -----				
State:				
Softwoods	91	1	92	30
Hardwoods	2	2	4	--
Total	93	3	96	30
Private:				
Softwoods	929	5	934	274
Hardwoods	33	30	63	8
Total	962	35	997	282
State and private:				
Softwoods	1,020	6	1,026	304
Hardwoods	35	32	67	8
Total	1,055	38	1,093	312

Table 13.--Net volume of growing stock on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, forest type, and stand-size class, 1979

Ownership class	Forest type	Stand-size class				All classes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked	Thousand cubic meters																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
State:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 14.--Net volume of sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, forest type, and stand-size class, 1979

Ownership class	Forest type	Stand-size class				All classes						
		Sawtimber	Poletimber	Sapling/seedling	Nonstocked							
State:		-	-	-	-	Thousand board feet, International 1/4-inch rule	-	-	-	-	-	-
	Douglas-fir	--	--		228	--					228	
	Ponderosa pine	11,199	1,654		61	48					12,962	
	Aspen	--	--		--	--					--	
	Cottonwood	673	10		--	--					683	
	All types	11,872	1,664		289	48					13,873	
Private:												
	Douglas-fir	2,617	--		1,172	--					3,789	
	Ponderosa pine	129,520	12,239		1,969	515					144,243	
	Aspen	6,554	--		--	--					6,554	
	Cottonwood	9,272	190		--	--					9,462	
	All types	147,963	12,429		3,141	515					164,048	
State and private:												
	Douglas-fir	2,617	--		1,400	--					4,017	
	Ponderosa pine	140,719	13,893		2,030	563					157,205	
	Aspen	6,554	--		--	--					6,554	
	Cottonwood	9,945	200		--	--					10,145	
	All types	159,835	14,093		3,430	563					177,921	

Table 15.--Net volume of growing stock on commercial timberland in McKinley, San Juan, and Valencia Counties by species and diameter class, 1979

Species	Diameter class (inches at breast height)													All classes		
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+			
	Thousand cubic feet															
Douglas-fir	66	148	222	94	110	--	62	--	269	105	45	--	--	1,121		
Ponderosa pine	1,388	4,314	5,453	5,811	4,993	4,851	4,466	2,776	2,211	903	817	550	1,424	39,957		
Engelmann spruce	30	50	121	--	--	--	--	--	--	--	--	--	--	201		
Pinyon/juniper	--	--	--	9	--	--	37	--	--	--	--	--	--	46		
Total softwoods	1,484	4,512	5,796	5,914	5,103	4,851	4,565	2,776	2,480	1,008	862	550	1,424	41,325		
Aspen	147	158	--	217	229	212	318	92	93	--	--	--	--	1,466		
Cottonwood	77	109	128	43	--	--	--	--	108	126	--	--	--	591		
Total hardwoods	224	267	128	260	229	212	318	92	201	126	--	--	--	2,057		
All species	1,708	4,779	5,924	6,174	5,332	5,063	4,883	2,868	2,681	1,134	862	550	1,424	43,382		

Table 16.--Net volume of sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by species and diameter class, 1979

Species	Diameter class (inches at breast height)												All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-22.9	23.0-24.9	25.0-26.9	27.0-28.9	29.0+		
	----- Thousand board feet, International 1/4-inch rule -----												
Douglas-fir	658	420	546	--	469	--	1,535	603	258	--	--	4,489	
Ponderosa pine	18,639	26,747	24,991	25,761	23,781	15,667	10,824	5,194	4,403	2,492	7,994	166,493	
Engelmann spruce	353	--	--	--	--	--	--	--	--	--	--	353	
Pinyon/juniper	--	26	--	--	104	--	--	--	--	--	--	130	
Total softwoods	19,650	27,193	25,537	25,761	24,354	15,667	12,359	5,797	4,661	2,492	7,994	171,465	
Aspen	XXXX	1,170	1,092	1,195	1,300	503	289	--	--	--	--	5,549	
Cottonwood	XXXX	200	--	--	--	--	333	374	--	--	--	907	
Total hardwoods	XXXX	1,370	1,092	1,195	1,300	503	622	374	--	--	--	6,456	
All species	19,650	28,563	26,629	26,956	25,654	16,170	12,981	6,171	4,661	2,492	7,994	177,921	

Table 17.--Net volume of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class and species, 1979

Ownership class	Species						
	Douglas-fir	Ponderosa pine	Engelmann spruce	Pinyon/juniper	Total softwoods	Aspen	Cotton-wood
							Total hardwoods
GROWING STOCK							
					Thousand cubic feet		
State	51	3,351	--	3	3,405	20	35
Private	1,070	36,606	201	43	37,920	1,446	556
Total	1,121	39,957	201	46	41,325	1,466	591
GROWING STOCK							
					Thousand cubic meters		
State	1	95	--	(¹)	96	1	1
Private	30	1 036	6	1	1 073	41	16
Total	31	1 131	6	1	1 169	42	17
SAWTIMBER							
					Thousand board feet, International 1/4-inch rule		
State	202	13,536	--	9	13,747	68	58
Private	4,287	152,957	353	121	157,718	5,481	849
Total	4,489	166,493	353	130	171,465	5,549	907

¹Less than 500 cubic meters.

Table 18.--Net volume of timber on commercial timberland in McKinley, San Juan, and Valencia Counties by class of timber, and softwoods and hardwoods, 1979

Class of timber	Softwoods	Hardwoods	All classes
- - - - - Thousand cubic feet - - - - -			
Sawtimber trees:			
Saw-log portion	33,149	1,350	34,499
Upper-stem portion	2,180	88	2,268
Total	35,329	1,438	36,767
Poletimber trees	5,996	619	6,615
All growing stock trees	41,325	2,057	43,382
Sound cull trees	3,836	224	4,060
Rotten cull trees	68	426	494
Salvable dead trees	1,855	125	1,980
All timber	47,084	2,832	49,916

Table 19.--Net volume of growing stock on commercial timberland in McKinley, San Juan, and Valencia Counties by forest type and species, 1979

Forest type	Species						All species
	Douglas-fir	Ponderosa pine	Engelmann spruce	Pinyon/juniper	Total softwoods	Cottonwood	Total hardwoods
- - - - - Thousand cubic feet - - - - -							
Douglas-fir	411	565	--	--	976	96	1,072
Ponderosa pine	544	37,420	--	46	38,010	275	38,285
Aspen	166	--	201	--	367	1,095	1,462
Cottonwood	--	1,972	--	--	1,972	591	2,563
All types	1,121	39,957	201	46	41,325	591	43,382
- - - - - Thousand cubic meters - - - - -							
All types	31	1 131	6	1	1 169	17	1 228

Table 20.--Net volume of sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by forest type and species, 1979

Forest type	Species							All species
	Douglas-fir	Ponderosa pine	Engelmann spruce	Pinyon/juniper	Total softwoods	Aspen	Cotton-wood	
	- - - - -	- - - - -	- - - - -	Thousand board feet, International 1/4-inch rule			- - - - -	- - - - -
Douglas-fir	1,225	2,792	--	--	4,017	--	--	4,017
Ponderosa pine	2,192	154,463	--	130	156,785	420	--	157,205
Aspen	1,072	--	353	--	1,425	5,129	--	6,554
Cottonwood	--	9,238	--	--	9,238	--	907	10,145
All types	4,489	166,493	353	130	171,465	5,549	907	177,921

Table 21.--Net annual growth of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class and species, 1979

Ownership class	Species					
	Douglas-fir	Ponderosa pine	Engelmann spruce	Total softwoods	Aspen	Cotton-wood
				Total softwoods		Total hardwoods
						All species
GROWING STOCK						
Cubic feet						
State	1,148	83,010	--	84,158	237	3,408
Private	28,201	958,958	11,809	998,968	28,203	82,572
Total	29,349	1,041,968	11,809	1,083,126	28,440	85,980
GROWING STOCK						
Cubic meters						
State	32	2 351	--	2 383	7	97
Private	799	27 155	334	28 288	798	2 338
Total	831	29 506	334	30 671	805	2 435
SAWTIMBER						
Board feet, International 1/4-inch rule						
State	3,004	375,533	--	378,537	583	10,987
Private	80,112	4,335,672	15,428	4,431,212	60,596	259,890
Total	83,116	4,711,205	15,428	4,809,749	61,179	271,460
						5,081,209

Table 22.--Annual mortality of growing stock and sawtimber on commercial timberland in McKinley, San Juan, and Valencia Counties by ownership class, and softwoods and hardwoods, 1979

Species group and ownership class	Growing stock		Sawtimber
	-Cubic feet-	-Cubic meters-	-Board feet ¹ -
Softwoods:			
State	6,421	182	27,396
Private	36,623	1 037	140,867
Total	43,044	1 219	168,263
Hardwoods:			
State	--	--	--
Private	--	--	--
Total	--	--	--
All owners	43,044	1 219	168,263

¹ International 1/4-inch rule.

Sterrett, Velma J.; Felt, Dorothy G. Forest area and timber resource statistics for State and private lands in McKinley, San Juan, and Valencia Counties, New Mexico, 1979. Resour. Bull. INT-31. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1983. 22 p.

Presents land area, commercial timberland area, timber inventory, and growth and mortality data based on Forest Survey standards.

KEYWORDS: forest surveys (regional), forest area classification, stand volume

The Intermountain Station, headquartered in Ogden, Utah, is one of eight regional experiment stations charged with providing scientific knowledge to help resource managers meet human needs and protect forest and range ecosystems.

The Intermountain Station includes the States of Montana, Idaho, Utah, Nevada, and western Wyoming. About 231 million acres, or 85 percent, of the land area in the Station territory are classified as forest and rangeland. These lands include grasslands, deserts, shrublands, alpine areas, and well-stocked forests. They supply fiber for forest industries; minerals for energy and industrial development; and water for domestic and industrial consumption. They also provide recreation opportunities for millions of visitors each year.

Field programs and research work units of the Station are maintained in:

Boise, Idaho

Bozeman, Montana (in cooperation with Montana State University)

Logan, Utah (in cooperation with Utah State University)

Missoula, Montana (in cooperation with the University of Montana)

Moscow, Idaho (in cooperation with the University of Idaho)

Provo, Utah (in cooperation with Brigham Young University)

Reno, Nevada (in cooperation with the University of Nevada)

